



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,755	11/12/2003	Sung-Min Kim	5649-1147	7540

7590 08/10/2005

Robert N. Crouse
Myers Bigel Sibley & Sajovec, P.A.
P.O. Box 37428
Raleigh, NC 27627

EXAMINER

SMOOT, STEPHEN W

ART UNIT	PAPER NUMBER
----------	--------------

2813

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/706,755

Applicant(s)

KIM ET AL.

Examiner

Stephen W. Smoot

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5,7,8 and 22-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,7,8,22-24 and 26-30 is/are rejected.
- 7) ☒ Claim(s) 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This Office action is in response to applicant's amendment filed on 02 June 2005.

Claim Objections

1. Claim 8 is objected to because of the following informality:

In claim 8, line 1, change the claim dependency from "claim 2" to --claim 1-- because the original claim 2 has been cancelled and its contents have been incorporated into claim 1.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 2813

3. Claims 1, 3-5, 7-8, 27-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the inner side wall" in line 9.

There is insufficient antecedent basis for this limitation in claim 1.

Claims 3-5, 7-8 are rejected under 35 U.S.C. 112, second paragraph, because they depend on claim 1.

Claim 27 recites the limitation "the substrate" in line 5.

There is insufficient antecedent basis for this limitation in claim 27.

Claims 28-30 are rejected under 35 U.S.C. 112, second paragraph, because they depend on claim 27.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 22-24, 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Akbar (US 5,656,845).

Art Unit: 2813

Referring to Fig. 1 and column 3, line 61 to column 4, line 43, Akbar discloses an n-channel EEPROM with the following structural features:

- A substrate that includes a silicon substrate (20) and an overlying oxide layer (22);
- An active layer of single crystal silicon (25) formed on the oxide layer (22);
- The single crystal silicon layer (25) can be epitaxially grown (see column 6, line 66 to column 7, line 1);
- Field oxide rows (72, 74) to isolate adjacent memory cells formed in direct contact with the oxide layer (22) (also see column 5, lines 11-16);
- A plurality of gates (44, 55, 62) within a memory cell between adjacent field oxide rows (72, 74) and over the oxide layer (22); and
- Three heavily doped n-type layers (38, 40, 58) that extend through the entire thickness of the single crystal silicon layer (25) to the oxide layer (22).

These are all of the limitations set forth in claims 22-24, 27-29 of the applicant's invention.

6. Claims 22-24, 26-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Zahurak et al. (US 2002/0160574 A1).

Referring to Fig. 2 and paragraphs [0022] to [0025], Zahurak et al. disclose an SOI device with the following structural features:

- A substrate that includes a bulk substrate (15) and an overlying insulating layer (20) that can be silicon nitride or silicon oxynitride;

- A semiconductor layer (30) that can be single crystal silicon formed on the insulating layer (20);
- The semiconductor layer (30) is divided into active area regions (34) by forming isolation regions (38) that are in direct contact with the insulating layer (20);
- A plurality of gate structures (45) formed within an active area region (34); and
- The active area regions (34) extend through the entire thickness of the semiconductor layer (30) to the insulating layer (20).

These are all of the structural limitations set forth in claims 22-24, 26-30 of the applicant's invention.

Regarding the epitaxial silicon limitations of claims 22-23, 27-28, these are process limitations and the patentability of product-by-process claims are based on the structure implied by the process steps (see MPEP section 2113). Regarding claims 22, 27, epitaxial silicon implies single crystal silicon and the burden shifts to the applicant to show otherwise. Further, regarding claims 23, 28, multiple layers of epitaxial silicon would not necessarily be distinguishable from a single layer of single crystal silicon because the multiple layers can have the exact same composition.

Allowable Subject Matter

7. Claim 25 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: Claim 25 would be allowable because the prior art of record does not teach or suggest, in combination with the other claim limitations, an integrated circuit structure that includes an isolation structure that electrically isolates an active region, the active region having a plurality of gates and having two insulation layers beneath the plurality of gates that extend between opposing portions of the isolation structure, wherein an epitaxial silicon layer extends from the active region through both insulation layers.

Response to Arguments

9. Applicant's arguments, see pages 8-9, filed 02 June 2005, with respect to claims 1, 3, 5, 7 have been fully considered and are persuasive. The prior art rejections of claims 1, 3, 5, 7 based wholly or partially on Park et al. (US 2002/0047158 A1) have been withdrawn.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kawanaka and Duvvury et al. teach SOI structures that include plural gates formed within an isolation region.

Art Unit: 2813

11. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen W. Smoot whose telephone number is 571-272-1698. The examiner can normally be reached on M-F (8:00 am to 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8000.

Art Unit: 2813

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SWS

A handwritten signature in black ink that reads "Stephen W. Smoot". The signature is written in a cursive, flowing style.

STEPHEN W. SMOOT
PRIMARY EXAMINER